ABSTRACT

A sense amplifier system for sensing the charge of a charge-storing means (601) comprises first and second charge reference means (600a,600b) connected in parallel and similar to the charge-storing means itself and having respectively opposite polarizations. The charge reference means (600a,600b) and the charge storing means (600) have a common input node (WL), and first and second pseudo-differential reference sense amplifiers (RSA_1, RSA_2) are connected with output nodes (RBL_1, RBL_2) of the charge reference means (600a,600b) for generating reference signals to a common reference node (CHREF) connected with a pseudo-differential sense amplifier (SA). The pseudo-differential sense amplifier (SA) has a second input for receiving an output signal from the charge-storing means (601) and generates an output signal indicative of a polarization state of the charge-storing means. Another sense amplifier system is generically similar, but adapted for sensing the charges of a plurality of charge-storing means (701) and comprises for this purpose at least two pairs of charge reference means (700). The charge-storing means (701) form the elements in an orthogonal matrix such that all elements in a row are connected with a pseudo-differential sense amplifier (SA). This sense amplifier system is implemented in a non-volatile matrix-addressable memory device comprising an electrical polarizable dielectric memory material exhibiting hysteresis, particularly a ferroelectric or electret material. The memory cells (801) of the memory device can be selectivly addressed for a write/read operation and the sense amplifier system (SA) is used for readout of polarization states of the memory cells.

Figs. 6, 7